Table of Contents

Preface .............................................................................................................................................. xxii

Section 1
General

Chapter 1
Past Futures: Innovation and the Railways of Nineteenth-Century London and Paris ................. 1
Carlos Lopez Galviz, Lancaster University, UK

Chapter 2
The Potential for Rail Transit as a Way to Mitigate Accident Risk: A Case Study in Chennai......... 23
Sumeeta Srinivasan, Tufts University, USA

Chapter 3
Planning Transit System for Indian Cities: Opportunities and Challenges ....................................... 40
Arnab Jana, Indian Institute of Technology Bombay, India
Ronita Bardhan, Indian Institute of Technology Bombay, India

Section 2
Finance

Chapter 4
Railway Investment Appraisal Techniques .......................................................................................... 67
Miloš Milenković, Zaragoza Logistic Center, Spain & University of Belgrade, Serbia
Libor Švadlenka, University of Pardubice, Czech Republic
Nebojša Bojović, University of Belgrade, Serbia
Vlastimil Melichar, University of Pardubice, Czech Republic

Chapter 5
Railway Demand Forecasting ............................................................................................................ 100
Miloš Milenković, Zaragoza Logistic Center, Spain & University of Belgrade, Serbia
Nebojša Bojović, University of Belgrade, Serbia
Chapter 6
Emerging Value Capture Innovative Urban Rail Funding and Financing: A Framework ............... 130
Satya Sai Kumar Jillella, Curtin University, Australia
Sitharam T G, Indian Institute of Science, India
Anne Matan, Curtin University, Australia
Peter Newman, Curtin University, Australia

Chapter 7
Analyzing Intercity Modal Choice and Competition Between High Speed Rail (HSR) and Other Transport Modes in Indian Context ................................................................. 146
Ashish Verma, Indian Institute of Science, India
Varun Raturi, Indian Institute of Science, India

Chapter 8
Jörg Schimmelpfennig, Ruhr-Universität Bochum, Germany

Section 3 Safety

Chapter 9
Challenges of Railway Safety Risk Assessment and Maintenance Decision Making ................. 173
Min An, University of Birmingham, UK
Yong Qin, Beijing Jiaotong University, China

Chapter 10
Formal Assurance of Signaling Safety: A Railways Perspective .................................................. 212
Pallab Dasgupta, Indian Institute of Technology Kharagpur, India
Mahesh Mangal, Indian Railways, India

Chapter 11
Automatic Static Software Testing Technology for Railway Signaling System .......................... 232
Jong-Gyu Hwang, Korea Railroad Research Institute, Korea
Hyun-Jeong Jo, Korea Railroad Research Institute, Korea

Chapter 12
Automated Testing: Higher Efficiency and Improved Quality of Testing Command, Control and Signaling Systems by Automation .......................................................... 250
Lennart Asbach, German Aerospace Center (DLR), Germany
Hardi Hungar, German Aerospace Center (DLR), Germany
Michael Meyer zu Hörste, German Aerospace Center (DLR), Germany
Chapter 13
Alertness Monitoring System for Vehicle Drivers using Physiological Signals

Anwesha Sengupta, Indian Institute of Technology Kharagpur, India
Anjith George, Indian Institute of Technology Kharagpur, India
Anirban Dasgupta, Indian Institute of Technology Kharagpur, India
Aritra Chaudhuri, Indian Institute of Technology Kharagpur, India
Bibek Kabi, Indian Institute of Technology Kharagpur, India
Aurobinda Routray, Indian Institute of Technology Kharagpur, India

Section 4
Operation

Chapter 14
Railway Operations Models: The OR Approach

Sundaravalli Narayanaswami, IIM Ahmedabad, India

Chapter 15
A General Simulation Modelling Framework for Train Timetabling Problem

Özgür Yalçınkaya, Dokuz Eylül University, Turkey

Chapter 16
Intelligent Transportation Systems: The State of the Art in Railways

Sundaravalli Narayanaswami, Indian Institute of Management, India

Chapter 17
Integrated Traffic Management using Data from Traffic, Asset Conditions, Energy and Emissions

Thomas Böhm, German Aerospace Center (DLR), Germany
Christoph Lackhove, German Aerospace Center (DLR), Germany
Michael Meyer zu Hörste, German Aerospace Center (DLR), Germany

Chapter 18
Disruption Management in Urban Rail Transit System: A Simulation Based Optimization Approach

Erfan Hassannayebi, Tarbiat Modares University, Iran
Arman Sajedinejad, Research Institute for Information Science and Technology (IRANDOC), Iran
Soheil Mardani, Tarbiat Modares University, Iran

Section 5
Engineering

Chapter 19
Steady State Modeling of Electric Railway Power Supply Systems for Planning and Operation Purposes

Pablo Arboleya, University of Oviedo, Spain
Chapter 20
Online Condition Monitoring of Traction Motor

Anik Kumar Samanta, Indian Institute of Technology Kharagpur, India
Arunava Naha, Indian Institute of Technology Kharagpur, India
Devasish Basu, Indian Railways, India
Aurobinda Routray, Indian Institute of Technology Kharagpur, India
Alok Kanti Deb, Indian Institute of Technology Kharagpur, India

Chapter 21
Dynamic Analysis of Steering Bogies

Arun K. Samantaray, Indian Institute of Technology Kharagpur, India
Smitirupa Pradhan, Indian Institute of Technology Kharagpur, India

Chapter 22
Ventilation and Air Conditioning in Tunnels and Underground Stations

Frederic Waymel, Egis Tunnels, France
Christophe Butaud, Egis Tunnels, France

Compilation of References

About the Contributors

Index